Construction

(SIC 15, 16, 17)

SIGNIFICANT POINTS

- Job opportunities are expected to be excellent.
- Workers in construction have relatively high hourly earnings.
- Construction is one of the economy's largest industries.
- More than 8 out of 10 establishments employ fewer than 10 people.
- Construction has a very large number of self-employed workers.

Nature of the Industry

Houses, apartments, factories, offices, schools, roads, and bridges are only some of the products of the construction industry. This industry's activities include work on new structures as well as additions, alterations, and repairs to existing ones. (Some government establishments do the same work and employ a significant number of people, but information about them is not included in this statement. Information concerning government construction is included in the statements on Federal Government and State and local government, except education and health, in the *Career Guide to Industries*.)

The construction industry is divided into three major segments: General building contractors, heavy construction contractors, and special trade contractors. *General building contractors* build residential, industrial, commercial, and other buildings. *Heavy construction contractors* build sewers, roads, highways, bridges, tunnels, and other projects. *Special trade contractors* are engaged in specialized activities such as carpentry, painting, plumbing, and electrical work.

Construction usually is done or coordinated by *general contractors* who specialize in one type of construction such as residential or commercial building. They take full responsibility for the complete job, except for specified portions of the work that may be omitted from the general contract. Although general contractors may do a portion of the work with their own crews, they often subcontract most of the work to heavy construction or special trade contractors.

Special trade contractors usually do the work of only one trade, such as painting, carpentry, or electrical work, or of two or more closely related trades, such as plumbing and heating. Beyond fitting their work to that of the other trades, special trade contractors have no responsibility for the structure as a whole. They obtain orders for their work from general contractors, architects, or property owners. Repair work is almost always done on direct order from owners, occupants, architects, or rental agents.

Working Conditions

Most employees in this industry work full time, many over 40 hours a week. In 2000, about 1 in 4 construction workers worked 45 hours or more a week; a large proportion of self-employed individuals also worked over 45 hours a week. Construction workers may sometimes work evenings, weekends, and holidays to finish a job or take care of an emergency. Workers in this industry need physical stamina because the work frequently requires prolonged standing, bending, stooping, and working in cramped quarters. They also may be required to lift and carry heavy objects. Exposure to weather is common because much of the work is done outside or in partially enclosed structures. Construction workers often work with potentially dangerous tools and equipment amidst a clutter of building materials; some work on temporary scaffolding or at great heights and in bad weather. Consequently, they are more prone to injuries than workers in other jobs. In 1999, cases of work-related injury and illness were 8.6 per 100 full-time workers, which is significantly higher than the 6.3 rate for the entire private sector. Workers who do roofing, masonry, stonework, and plastering experienced the highest injury rates. In response, employers increasingly emphasize safe working conditions and work habits that reduce the risk of injuries. To avoid injury, employees wear safety clothing, such as gloves and hard hats, and sometimes devices to protect their eyes, mouth, or hearing.

Employment

Construction, with 6.7 million wage and salary and 1.6 million self-employed and unpaid family nongovernment jobs in 2000, was one of the Nation's largest industries.

More than 3 out of 5 wage and salary jobs were with special trade contractors, primarily plumbing, electrical, and masonry contractors. More than 1 out of 5 jobs were with general building contractors, mostly in residential and nonresidential construction. The rest were with road and other heavy construction contractors (table 1). Employment in this industry is distributed geographically in much the same way as the Nation's population; the concentration of employment is generally in industrialized and highly populated areas.

There were about 667,000 construction companies in the United States in 1997: 197,091 were general contractors and operative builders; 37,701 were heavy construction or highway contractors; and 431,877 were specialty trade contractors. Most of these establishments tend to be small, the majority employing fewer than 10 workers (chart 1). About 8 out of 10 workers are employed by small contractors.

Construction offers more opportunities than most other industries for individuals who want to own and run their own business. The 1.6 million self-employed and unpaid family workers in 2000 performed work directly for property owners or acted as contractors on small jobs, such as additions, remodeling, and maintenance projects. The large majority of the self-employed work in the construction trades. The rate of self-employment varies greatly by individual occupation in the construction trades (chart 2).

Table 1. Nongovernment distribution of wage and salary employment in construction by industry, 2000

(Employment in thousands)

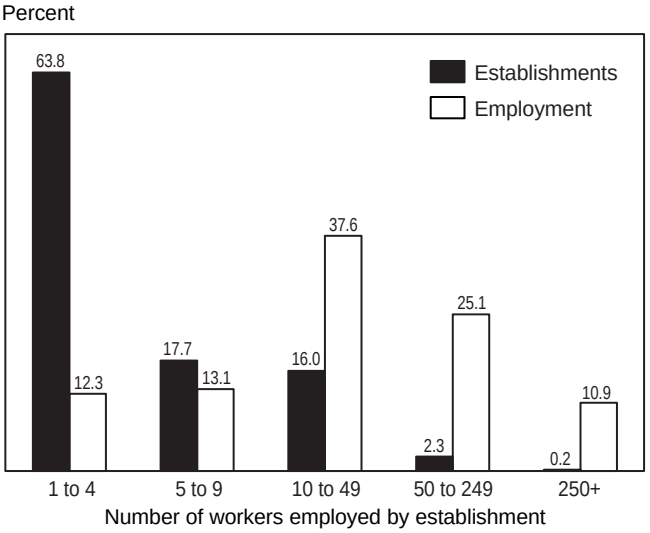
Industry	Employment	2000-10 Percent change
Total, all industries	6,698	100.0
General building contractors	1,528	22.8
Residential building	826	12.3
Operative builders	31	0.5
Nonresidential building construction	670	10.0
Heavy construction, except building	901	13.5
Highway and street construction	280	4.2
Heavy construction, except highway	621	9.3
Special trade contractors	4,269	63.7
Plumbing, heating, and air conditioning	937	14.0
Painting and paper hanging	228	3.4
Electrical work	866	12.9
Masonry, stonework, and plastering	567	8.5
Carpentry and floor work	324	4.8
Roofing, siding, and sheet metal work	253	3.8

Occupations in the Industry

Work in construction offers a great variety of career opportunities. People with many different talents and educational backgrounds—managers, clerical workers, skilled craftsworkers, semiskilled workers, and laborers—find job opportunities in construction and related activities (table 2).

Most of the workers in construction are skilled craftsworkers or laborers, helpers, and apprentices who assist the more skilled workers. Most construction workers generally are classified as either structural, finishing, or mechanical workers. *Structural workers* include carpenters; construction equipment operators; brickmasons, blockmasons, and stonemasons; cement masons and concrete finishers; and structural and reinforcing iron and metal workers. *Finishing workers* include carpenters; drywall installers, ceiling tile installers, and tapers; plasterers and stucco masons; segmental pavers; terrazzo workers; painters and

Most construction establishments employ fewer than 10 people



Source: U.S. Department of Commerce, *County Business Patterns*, 1997

Table 2. Employment of wage and salary workers in construction by occupation, 2000 and projected change, 2000-10

(Employment in thousands)

Occupation	Employment, 2000 Number	Employment, 2000 Percent	Percent change, 2000-2010
All occupations	6,698	100.0	12.3
Management, business, and financial occupations	602	9.0	11.2
Construction managers	182	2.7	14.1
General and operations managers	161	2.4	7.3
Cost estimators	105	1.6	13.8
Professional and related occupations	97	1.4	7.9
Architecture and engineering occupations	81	1.2	3.9
Service occupations	49	0.7	12.0
Sales and related occupations	109	1.6	6.2
Office and administrative support occupations	575	8.6	0.6
Bookkeeping, accounting, and auditing clerks	126	1.9	-2.3
Office clerks, general	74	1.1	13.2
Executive secretaries and administrative assistants	71	1.1	2.2
Secretaries, except legal, medical, and executive	135	2.0	-9.3
Construction and extraction occupations	4,526	67.6	13.7
First-line supervisors/managers of construction trades and extraction workers	370	5.5	13.6
Brickmasons and blockmasons	98	1.5	14.1
Carpenters	681	10.2	10.0
Carpet, floor, and tile installers and finishers	64	1.0	8.6
Cement masons and concrete finishers	139	2.1	4.0
Construction laborers	701	10.5	15.2
Operating engineers and other construction equipment operators	198	3.0	10.4
Drywall and ceiling tile installers	111	1.7	13.5
Electricians	464	6.9	18.3
Painters, construction and maintenance	184	2.8	11.0
Plumbers, pipefitters, and steamfitters	335	5.0	11.0
Roofers	111	1.7	19.0
Sheet metal workers	149	2.2	29.1
Structural iron and steel workers	70	1.0	18.2
Helpers—Brickmasons, blockmasons, stonemasons, and tile and marble setters	56	0.8	13.7
Helpers—Carpenters	93	1.4	5.7
Helpers—Electricians	109	1.6	13.0
Helpers—Pipelayers, plumbers, pipe fitters, and steamfitters	81	1.2	11.1
Installation, maintenance, and repair occupations	399	6.0	16.5
Electrical and electronic equipment mechanics, installers, and repairers	59	0.9	1.5
Heating, air conditioning, and refrigeration mechanics and installers	93	1.4	25.2
Production occupations	101	1.5	11.3
Transportation and material moving occupations	239	3.6	14.8
Truck drivers, heavy and tractor-trailer	99	1.5	16.0
Material moving occupations	102	1.5	14.5

NOTE: May not add to totals due to omission of occupations with small employment.

paperhangers; glaziers; roofers; carpet, floor, and tile installers and finishers; and insulation workers. *Mechanical workers* include pipelayers, plumbers, pipefitters, and steamfitters; electricians; sheet metal workers, and heating, air conditioning, and refrigeration mechanics and installers. Other workers, called *hazardous materials removal workers* remove hazardous materials such as asbestos, lead, and radioactive and nuclear materials from buildings, facilities, and the environment to avoid further contamination of natural resources and to promote public health and safety.

The greatest number of construction craftsworkers work as carpenters; electricians; pipelayers, plumbers, pipefitters, and steamfitters; construction equipment operators; painters and paperhangers; sheet metal workers; drywall installers, ceiling tile installers, and tapers; cement masons, concrete finishers, segmental pavers, and terrazzo workers; brickmasons, blockmasons, and stonemasons; and roofers.. The construction industry employs nearly all of the workers in some construction craft occupations—such as plasterers and stucco masons; roofers; structural and reinforcing iron and metal workers; and drywall installers, ceiling tile installers, and tapers. In other construction craft occupations—for example, electricians, painters and paperhangers; plumbers, pipefitters, and steamfitters; and carpet floor, and tile installers and finishers—large numbers also work in other industries (table 3). Other industries employing large numbers of construction workers include transportation equipment manufacturing, transportation, communication and utilities, real estate, wholesale and retail trade, educational services, and State and local government.

Many persons enter the construction crafts through apprenticeship programs. These programs offer on-the-job training under the close supervision of a craftworker, as well as some formal classroom instruction. Depending on the trade, apprentices learn a variety of skills, ranging from laying brick to putting together steel beams.

Many persons advance to construction craft occupations from related, less skilled jobs as *helpers* or *laborers.* They acquire skills while they work. They are first hired as laborers or helpers, performing a variety of unskilled tasks and providing much of the routine physical labor needed in construction. They erect and dismantle scaffolding, clean up debris, help unload and carry materials and machinery, and operate simple equipment. They work alongside experienced craftworkers, learning the basic skills of a particular craft. After acquiring experience and skill in various phases of the craft, they may become skilled journey level craftworkers.

To develop their skills further after training, construction craftworkers may work on many different projects, such as housing developments, office and industrial buildings, or highways, bridges, and dams. Flexibility and a willingness to adopt new techniques, as well as the ability to get along with people, are essential for advancement. Those skilled in all facets of the trade and who show good leadership qualities may be promoted to *supervisor.* As supervisors, they oversee craftworkers and helpers and ensure work is done well. They plan the job and solve problems as they arise. Those with good organizational skills and exceptional supervisory ability may advance to *superintendent.* Superintendents are responsible for getting a project completed on schedule by working with the architect's plans, making sure materials are delivered on time, assigning work, overseeing craft supervisors, and making sure every phase of the project is completed properly and expeditiously. They also resolve problems and see to it that work proceeds without interruptions. Superintendents may advance to large projects as general managers and top executives. Some go into business for themselves as contractors.

Table 3. Percent of wage and salary workers in construction craft occupations employed in the construction industry, 2000

Occupation	Employed
Insulation workers	88.4
Cement masons, concrete finishers, and terrazzo workers	85.3
Structural iron and steel workers	83.7
Plasterers and stucco masons	79.7
Drywall installers, ceiling tile installers, and tapers	77.6
Roofers	70.5
Brickmasons, blockmasons, and stonemasons	67.4
Plumbers, pipefitters, and steamfitters	66.7
Electricians	66.5
Glaziers	64.1
Carpenters	56.6
Carpet, floor, and tile installers and finishers	38.4
Painters, construction and maintenance	37.5
Paperhangers	27.5

Training and Advancement

Persons may enter most jobs in the construction industry without any formal classroom training after high school. Laborers can learn their job in a few days, but the skills required for many jobs are substantial; they can be learned on the job or through apprenticeships. Skilled workers such as carpenters, bricklayers, plumbers, and other construction trade specialists need either several years of informal on-the-job experience, or apprenticeship training. Workers pick up skills by working alongside more experienced workers, and through instruction provided by their employers. As they demonstrate their ability to perform tasks they are assigned, they move to progressively more challenging work. As they broaden their skills, they are allowed to work more independently, and responsibilities and earnings increase. They may qualify for jobs in related, more highly skilled, occupations. For example, after several years of experience, painters' helpers may become journey level painters.

Apprenticeships administered by local employers, trade associations, and trade unions provide the most thorough training. Apprenticeships usually last between 3 and 5 years and consist of on-the-job training and 144 hours or more of related classroom instruction. However, a number of apprenticeship programs are now using competency standards in place of time requirements, making it possible to complete a program in a shorter time. Those who enroll in apprenticeship programs usually are least 18 years old and in good physical condition.

Persons can enter the construction industry with a variety of educational backgrounds. Those entering construction right out of high school start as laborers, helpers, or apprentices. Those who enter construction from technical or vocational schools also may go through apprenticeship training; however, they progress at a somewhat faster pace because they already have had courses such as mathematics, mechanical drawing, and woodworking. Skilled craftworkers may advance to supervisor or superintendent positions, or may transfer to jobs such as construction building inspector, purchasing agent, sales representative for building supply companies, contractor, or technical or vocational school instructor.

Managerial personnel usually have a college degree or considerable experience in their specialty. Individuals who enter construction with college degrees usually start as management trainees or construction managers' assistants. Those who receive degrees in construction science often start as field engineers, schedulers, or cost estimators. College graduates may advance to positions such as assistant manager, construction manager, general superintendent, cost estimator, construction building inspector, general manager or top executive, contractor, or consultant. Although a college education is not always required, administrative jobs usually are filled by people with degrees in business administration, finance, accounting, or similar fields.

Opportunities for workers to form their own firms are better in construction than in many other industries. Construction workers need only a moderate financial investment to become contractors and they can run their businesses from their homes, hiring additional construction workers only as needed for specific projects. The contract construction field, however, is very competitive, and the rate of business failure is high.

Earnings

Earnings in construction are significantly higher than the average for all industries (table 4). In 2000, production or nonsupervisory workers in construction averaged $17.86 an hour, or about $702 a week. Average earnings of workers in the special trade contractors segment were somewhat higher than those of workers employed by building or heavy construction contractors.

Earnings of workers in the construction industry vary by the education and experience of the worker, type of work, the size and nature of the construction project, geographic location, and economic conditions. Earnings of construction trade workers also are often affected by poor weather. Traditionally, winter is the slack period for construction activity, especially in colder parts of the country. Some workers, such as laborers or roofers, may not work for several months. Heavy rain also may slow or even stop work on a construction project. Because construction trades are dependent on one another—especially on large projects—work delays in one trade delay or stop work in another. Earnings in selected occupations in construction in 2000 appear in table 5.

Table 4. Average earnings of nonsupervisory workers in construction, 2000

Industry segment	Weekly	Hourly
Total, private industry	$474	$13.74
Construction industry	702	17.86
General building contractors	655	17.20
Residential building contractors	585	15.91
Operative builders	643	17.00
Nonresidential building contractors	733	18.51
Heavy construction	749	17.33
Highway and street construction	769	17.59
Heavy construction, except highway	738	17.21
Special trade contractors	706	18.20
Plumbing, heating, and air conditioning	736	18.64
Painting and paper hanging	589	15.87
Electrical work	806	20.16
Masonry, stonework, and plastering	643	17.66
Carpentry and floor work	670	18.11
Roofing, siding, and sheet metal work	551	15.73

About 20.4 percent of all workers were union members or covered by union contracts, compared with 15 percent of workers throughout private industry. Many different unions represent the various construction trades and form joint apprenticeship committees with local employers to supervise apprenticeship programs.

Table 5. Median hourly earnings of the largest occupations in construction, 2000

Occupation	General building contractors	Heavy construction, except building	Special trade contractors	All industries
General and operations managers	$ 32.72	$ 34.02	$ 31.12	$ 29.41
Construction managers	27.23	27.89	27.40	28.00
Cost estimators	23.38	25.14	22.57	22.02
First-line supervisors/ managers of construction trades and extraction workers	22.03	21.09	21.44	21.53
Plumbers, pipefitters, and steamfitters	18.97	17.26	18.09	18.19
Brickmasons and blockmasons	18.78	19.51	19.59	19.37
Operating engineers and other construction equipment operators	18.08	17.35	16.91	15.99
Electricians	16.70	17.93	19.19	19.29
Carpenters	15.97	16.82	16.14	15.69
Construction laborers	11.15	11.60	11.35	11.15

Outlook

Job opportunities are expected to be excellent in the construction industry, due largely to the numerous openings arising each year from experienced construction workers who leave jobs. Further, many potential workers may prefer work that is less strenuous and has more comfortable working conditions. The continued shortage of adequate training programs also will contribute to the favorable job market.

The number of wage and salary jobs in the construction industry is expected to grow about 12 percent through the year 2010, compared with 15 percent projected for all industries combined. Employment in this industry depends primarily on the level of construction and remodeling activity. New construction is usually cut back during periods when the economy is not expanding, and the number of job openings in construction fluctuates greatly from year to year. Employment growth in the various segments of the construction industry varies somewhat, depending on the demand for various types of construction. At times, there may be a high demand for new office space or housing, for example, but lower demand for road construction or remodeling work.

Although household growth may slow slightly over the coming decade, the demand for residential construction is expected to continue to grow. The demand for larger homes with more amenities, as well as for second homes, will continue to rise, especially as the baby boomers reach their peak earning years and can afford to spend more on housing. Some older, more affluent baby boomers will want townhouses and condominiums in conveniently located suburban and urban settings. At the same time, as the number of immigrants increases and as the "echo boomers" (the children of the baby boomers) start to replace the smaller "baby bust" generation in the young adult age groups, the demand for manufactured housing, starter homes, and rental apartments also is expected to increase.

Employment in nonresidential construction is expected to grow a little faster than the rest of the industry because industrial construction activity is expected to be stronger as replacement of many industrial plants has been delayed for years, and a large number of structures will have to be replaced or remodeled. Construction of nursing, convalescent homes, and other extended care institutions also will increase due to the aging of the population, the growing use of high-technology medical treatment facilities, and the need for more drug treatment clinics. Construction of schools will increase to accommodate the children of the baby boom generation.

Employment in heavy construction is projected to increase about as fast as the industry average. Growth is expected in highway, bridge, and street construction, as well as in repairs to prevent further deterioration of the Nation's highways and bridges. Poor highway conditions also will result in increased demand for highway maintenance and repair.

Employment in special trades contracting, the largest segment of the industry, should grow at about the same rate as the entire construction industry. Demand for special trades subcontractors in building and heavy construction is rising, and, at the same time, more workers will be needed to repair and remodel existing homes. Home improvement and repair construction is expected to continue to grow faster than new home construction. Remodeling should be the fastest growing sector of the housing industry because of a growing stock of old residential and nonresidential buildings. Many "starter" units will be remodeled to appeal to more affluent, space- and amenity- hungry buyers. Also, some of the trade-up market may result in remodeling and additions rather than the construction of new, larger homes. Remodeling tends to be more labor-intensive than new construction.

Employment growth will differ among various occupations in the construction industry. Employment of construction managers is expected to grow as a result of advances in building materials and construction methods, as well as a proliferation of laws dealing with building construction, worker safety, and environmental issues. Construction managers with a bachelor's degree in construction science with an emphasis on construction management, and who acquire work experience in construction management services firms, should have an especially favorable job outlook. Little change in the employment of administrative support occupations is expected due to increased office automation.

Although employment in construction trades is expected to grow about as fast as the industry average, the rate of growth will vary among the various trades. Employment of brickmasons, blockmasons, and stonemasons; electricians; glaziers; sheet metal workers; and heating, air conditioning, and refrigeration mechanics and installers should grow faster than the industry average because technological changes are not expected to offset employment demand as construction activity grows. Employment of carpenters; carpet, floor, and tile installers and finishers; and cement masons, concrete finishers, segmental pavers, and terrazzo workers is expected to grow more slowly than the construction industry as a whole because the demand for these workers is expected to be offset by a greater use of new materials and equipment. For example, increasing use of prefabricated components in residential construction is expected to reduce the demand for carpenters.

Sources of Additional Information

Information about apprenticeships and training can be obtained from local construction firms and employer associations, the local office of the State employment service or apprenticeship agency, or the Bureau of Apprenticeship and Training, U.S. Department of Labor.

For additional information on jobs in the construction industry, contact:

- Associated Builders and Contractors, 1300 North 17th St., Rosslyn, VA 22209. Internet: **http://www.abc.org**
- Associated General Contractors of America, Inc., 1957 E St. NW., Washington, DC 20005. Internet: **http://www.agc.org**
- National Association of Home Builders, 15th and M Sts. NW., Washington, DC 20005. Internet: **http://www.nahb.org**

Additional information on occupations in construction may be found in the 2002-03 edition of the *Occupational Outlook Handbook:*

- Brickmasons, blockmasons, and stonemasons
- Carpenters
- Carpet, floor, and tile installers and finishers
- Cement masons, concrete finishers, segmental pavers, and terrazzo workers
- Construction and building inspectors
- Construction equipment operators
- Construction laborers
- Construction managers
- Drywall installers, ceiling tile installers, and tapers
- Electricians
- Elevator installers and repairers
- Glaziers
- Hazardous materials removal workers
- Heating, air conditioning, and refrigeration mechanics and installers
- Insulation workers
- Material moving occupations
- Painters and paperhangers
- Pipelayers, plumbers, pipefitters, and steamfitters
- Plasterers and stucco masons
- Roofers
- Sheet metal workers
- Structural and reinforcing iron and metal workers